REMARKS

Claims 1-7 and 16-36 are pending in the present application.

The rejections of: (a) Claims 31-33 under 35 U.S.C. §103(a) over Rosenberg et al in view of Labows et al and Natsch et al and (b) Claims 34-36 under 35 U.S.C. §103(a) over Rosenberg et al in view of Labows et al, Natsch et al, and Hoer et al are respectfully traversed.

The Examiner maintains that Claims 31-33 are obvious in view of the combination of Rosenberg et al, Labows et al, and Natsch et al. Claims 34-36 are also rejected over this combination of references with the addition of Hoer et al. The core of the Examiner's basis for the rejection has not changed since the Office Action mailed April 6, 2009. In response to Applicants arguments presented in the response filed on August 5, 2009, the Examiner inaccurately alleges that our arguments were "against the references individually". While it is true that each reference was discussed individually to show the respect deficiencies in their disclosures, the arguments on pages 18-20 of the response filed on August 5, 2009, clearly articulate why the combined disclosures of Rosenberg et al, Labows et al, and Natsch et al are deficient. Further, Applicants submit that Hoer et al fail to compensate for the deficiencies in the combined disclosures of Rosenberg et al, Labows et al, and Natsch et al.

On page 5 of the Office Action, the Examiner alleges that the argument that Rosenberg et al is directed to an indirect gauge of malodor and that 3-hydroxy-3-methylhexanoic acid is not identified therein as an indirect gauge is irrelevant because Natsch et al identify 3-hydroxy-3-methylhexanoic acid as a key malodor volatile in human sweat. The Examiner then cites Labows et al as allegedly disclosing that the various fatty acids in Natsch et al produce different types of malodor. Applicants disagree.

The fact remains that none of the cited art disclose or suggest the colorimetric test to determine the kind and relative strength of body odor as in the claimed invention. Although Rosenberg et al disclose a colorimetric test (see Example 2), this disclosure relates solely to saliva samples. As such, the disclosure of Rosenberg et al (bad breadth) is not analogous art with Labows et al (body odor) and Natsch et al (compound found in human sweat) and are, therefore, not combinable. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art. *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, ___, 82 USPQ2d 1385, 1396 (2007) There is certainly no suggestion in the cited art that the colorimetric test disclosed by Rosenberg et al would be suitable and/or would be expected to work with axillary samples to detect the kind and/or strength of the body odor as claimed. Labows et al, Natsch et al, and Hoer et al do not solve this problem or suggest the solution and/or applicability of a colorimetric test as claimed.

Indeed, the color reaction in Rosenberg et al is not a color reaction of oral malodor itself, but is a color reaction using an enzyme in saliva which produces oral malodor. In addition, in the color reaction in Rosenberg et al, a reagent (X-gel) which is colored by decomposition caused by the enzyme is used.

Natsch et al disclose that 3-hydroxy-3-methylhexanoic acid is a key component of human malodor. However, even if 3-hydroxy-3-methylhexanoic acid is used for the color reaction disclosed in Rosenberg et al a color reaction is not produced. Natsch et al disclose substrates that give 3-hydroxy-3-methylhexanoic acid, therefore, if Natsch et al and Rosenberg et al are combined the skilled artisan may conduct the color reaction using the substrate. However, that is not what is claimed.

Moreover, in Rosenberg et al the presence or absence of odor is merely assessed by a color reaction, but the quality and strength of the odor are not assessed by a color reaction as required by the claimed ivention.

Applicants remind the Examiner that the invention of Claims 31-36 is drawn to a methods of assessing body odor of a human comprising steps of:

> a first step of extracting a mixture of β-hydroxycarboxylic acid and fatty acid having 12 or less carbons other than said β-hydroxycarboxylic acid from perspiration of a human;
> a second step of adding a coloration reagent which reacts with the β-hydroxycarboxylic acid and/or the fatty acid having 12 or less carbon atoms other than said β-hydroxycarboxylic acid to the mixture to exhibit color; and
> a third step of assessing the kind and/or strength of body odor from the color exhibited in the second step. (see Claim 31)
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> a first step of extracting a mixture of β-hydroxycarboxylic acid and fatty acid having 12 or less carbons other than said β-hydroxycarboxylic acid from perspiration of a human;
> a second step of separating β-hydroxycarboxylic acid from the mixture;
> a third step of reacting said β-hydroxycarboxylic acid separated in the second step with a coloration reagent which reacts with the β-hydroxycarboxylic acid and/or the fatty acid having 12 or less carbon atoms other than said β-hydroxycarboxylic acid to exhibit color; and
> a fourth step of assessing the kind and/or strength of body odor from the color exhibited in the third step. (see Claim 32)
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> a first step of extracting a mixture of β-hydroxycarboxylic acid and fatty acid having 12 or less carbons other than said β-hydroxycarboxylic acid from perspiration of a human;
> a second step of separating the mixture into β-hydroxycarboxylic acid and fatty acid having 12 or less carbons other than said β-hydroxycarboxylic acid respectively;
> a third step of reacting said β-hydroxycarboxylic acid separated in the second step with a coloration reagent which reacts with the β-hydroxycarboxylic acid to exhibit color;
> a fourth step of reacting said fatty acid having 12 or less carbons other than said β-hydroxycarboxylic acid separated in the second step

> with a coloration reagent which reacts with the fatty acid having 12 or less carbon atoms other than said β-hydroxycarboxylic acid to exhibit color; and
>
> a fifth step of assessing the kind and/or strength of body odor from each of the colors exhibited in the third and fourth steps. (see Claim 33)

With respect to the foregoing, Applicants again submit that the substances used as indexes in this method are quite similar to apocrine odor of axillary regions and are specifically present in a person who has apocrine odor. 3-hydroxy-3-methylhexanoic acid is specifically present in axillary regions of a person who has apocrine odor. The apocrine odor is stronger in a person who has more 3-hydroxy-3-methylhexanoic acid contained in the perspiration of the axillary regions. The present inventors have found that 3-hydroxy-3-methylhexanoic acid contributes to a spicy cumin-like odor, which is a particularly important component of odor among major bad odors constituting the apocrine odor.

Also, the inventors have found that, among odor components of several kinds of body odors, the presence amount of β-hydroxycarboxylic acid having a cumin-like odor is strongly related to and the level of body odor, and considered that β-hydroxycarboxylic acid can be used as an indicator material. The β-hydroxycarboxylic acid compound represented by Formula (1), which is a group of compounds having a chemical structure quite similar to 3-hydroxy-3-methylhexanoic acid, is similar in characteristics such as chemical characteristics and organoleptic characteristics (particularly, odor) to 3-hydroxy-3-methylhexanoic acid, thus, the β-hydroxycarboxylic acid compound can be used as an objective index for assessing apocrine odor similarly to 3-hydroxy-3-methylhexanoic acid. The β-hydroxycarboxylic acid compound including 3-hydroxy-3-methylhexanoic acid can be separated from other substances which are low in contribution to the apocrine odor utilizing differences in polarity, solubility or the like.

The inventors of the present invention have discovered that 3-mercapto-3-methylhexanol and a 3-mercapto alcohol compound, which is a group of compounds having a chemical structure quite similar thereto, are specifically present in the person who has the apocrine odor and the apocrine odor is stronger in a person who has more 3-mercapto-3-methylhexanol and 3-mercapto alcohol compound contained in the perspiration of the axillary regions. 3-mercapto-3-methylhexanol and 3-mercapto alcohol compound contribute to a fishy sulfur-like odor of the apocrine odor. As the 3-mercapto alcohol compound has not only a hydroxyl group but also a mercapto group at the 3-position, the derivative which is chemically modified can also be used as an index for assessing apocrine odor.

With respect to the method of assessing body odor according to Claims 31-36, these claims relate to a method where the level of apocrine odor itself or a total body odor with focus on apocrine odor can be surely and easily assessed from the color exhibited by reacting β-hydroxycarboxylic acid and fatty acid having 12 or less carbons other than the β-hydroxycarboxylic acid, which are separated from perspiration of human, with a coloration reagent respectively. According to the assessment methods of Claims 31-36, not only strength of odor but also a kind of odor can be assessed by the exhibited colors.

Specifically, not only a level of the apocrine odor but also a level of total odor of the apocrine odor with acid odor can be quickly and easily assessed. For example, the assessment of the total odor originated from both β-hydroxycarboxylic acid (primarily causes the apocrine odor) and fatty acid having 12 or less carbons other than said β-hydroxycarboxylic acid (primarily causes acid odor), and also the assessment of the apocrine odor originated from β-hydroxycarboxylic acid can be performed together by adding a coloration reagent respectively to acid material extracted from perspiration, and β-hydroxycarboxylic acid separated from the acid material, and observing the exhibited colors.

Specifically, these method permit a level of contribution of apocrine odor and acid odor in axillary odors to be quickly and easily assessed by the assessment of total odor thereof and the apocrine odor.

Alternatively, a level of contribution of apocrine odor and acid odor in axillary odor can be assessed by separating an acid material extracted from perspiration of a human into β-hydroxycarboxylic acid, which causes apocrine odor, and fatty acid having 12 or less carbons other than said β-hydroxycarboxylic acid, which causes acid odor, and adding a coloration reagent thereto respectively to observe the exhibited colors.

The results demonstrated in Examples C to E illustrate that, in accordance with the present invention, the presence or contribution of the apocrine odor together with acid odor can be assessed. This is in no way disclosed or suggested by the combined disclosures of Rosenberg et al, Labows et al, Natsch et al, and Hoer et al.

Particularly, in the case of using a compound having a hydrazino group such as 2-nitrophenylhydrazine as a coloration reagent, sensitivity in detecting β-hydroxycarboxylic acid originated from the perspiration of a human is increased and the colorimetry test with the naked eye can be easily performed. Also, in the case of using a compound having a diazomethyl group such as 9-anthryldiazomethane as a coloration reagent, sensitivity in detecting β-hydroxycarboxylic acid is increased and the reaction proceeds under a mild condition without catalyst and heating, therefore, the assessment is easily performed. Again, this is in no way disclosed or suggested by the combined disclosures of Rosenberg et al, Labows et al, Natsch et al, and Hoer et al.

With the foregoing in mind, Applicants once again provide the following discussion with respect to the cited art. Natsch et al disclose an invention whose object is to prevent or suppress human malodor, in particular human axillary malodor. More specifically, Natsch et

al discloses that essentially odorless precursor compounds (substrates of enzyme) in sweat are cleaved by an enzyme to release malodorous compounds such as 3-hydroxy-3-methyl-hexanoic acid having a pungent odor. Also, Natsch et al disclose that 3-hydroxy-3-methyl-hexanoic acid dehydrates to give 3-methyl-3-hexenoic acid which is another key component of human axillary malodor.

Rosenberg et al disclose a method for gauging the presence and level of oral malodor based on the estimation of the activity of β-galactosidase, which is an enzyme producing an odor substance contributing to oral malodor. As a specific example of the method for the assessment of the enzyme activity, a color reaction is used. Also, in Rosenberg et al, the assessment substance is an enzyme which produces an odor substance, and not the odor substance itself. It means that human malodor (oral malodor) is indirectly gauged.

Labows et al disclose low reliability of organoleptic tests of body odor, and plural components including short-chain fatty acids such as 3-methylhexenoic acid as the causative agents of axillary odor.

Hoer et al is merely cited as disclosing that the fluorescent chromophore 9-anthryldiazomethane was developed as a fluorescent marker for HPLC analysis of fatty acids. However, the disclosure by Hoer et al in no way relates to the method of the invention claimed in Claims 31-33 and does not compensate for the deficiencies in the disclosures of Rosenberg et al, Labows et al, and Natsch et al.

It is not disclosed nor implied in any of Rosenberg et al, Labows et al, Natsch et al, and Hoer et al that 3-mercapto alcohol compound represented by Formula (3) and the derivative of 3-mercapto alcohol compound represented by Formula (4) in the specification of the present application contribute to apocrine odor, particularly, sulfur-like odor. Hence, it is not disclosed nor implied that a mixture containing 3-hydroxy-3-methyl-hexanoic acid and

3-mercapto alcohol compound and/or a derivative thereof has an odor similar to apocrine odor.

In addition, there is no disclosure or suggestion in any of Rosenberg et al, Labows et al, Natsch et al, and Hoer et al about the importance of 3-hydroxy-3-methyl-hexanoic acid as a causative agent of axillary odor and the quality of its odor. Natsch et al disclose 3-hydroxy-3-methyl-hexanoic acid and 3-methyl-3-hexenoic acid as causative agents of axillary odor, but does not disclose at all about the difference of these odors in types and level of contribution to axillary odor. Hence, there is no motivation, in any of the above cited documents, to select 3-hydroxy-3-methyl-hexanoic acid as an indicator of body odor of a human among plural causative agents of axillary odor disclosed in the above cited documents.

Specifically, Rosenberg et al, Labows et al, Natsch et al, and Hoer et al do not disclose or imply a method for assessing body odor of a human using β-hydroxycarboxylic acid represented by 3-hydroxy-3-methyl-hexanoic acid together with a 3-mercapto alcohol compound represented by 3-mercapto-3-methylhexanol and/or a derivative thereof as indicators, and that assessing axillary odor excellent in reproducibility of actual apocrine odor is capable by the method.

Also, Natsch et al, as aforementioned, disclose that 3-hydroxy-3-methyl-hexanoic acid has a pungent odour of axillar, however, there is no mention about difference in types of odor between 3-hydroxy-3-methyl-hexanoic acid and fatty acids having 12 or less carbon atoms other than β-hydroxycarboxylic acid such as 3-methyl-3-hexenoic acid.

Specifically, Natsch et al do not disclose nor imply that β-hydroxycarboxylic acid and fatty acid having 12 or less carbon atoms other than β-hydroxycarboxylic acid contribute to different types (quality) of body odor of a human such that β-hydroxycarboxylic acid

represented by 3-hydroxy-3-methyl-hexanoic acid contributes to cumin-like apocrine odor while fatty acid having 12 or less carbon atoms other than β-hydroxycarboxylic acid contributes to acid odor. In addition, Natsch et al do not disclose nor imply that the comprehensive strength and quality of body odor of a human, particularly, axillary odor, and the level of contribution to the body odor by each odor substance are assessed by separating β-hydroxycarboxylic acid represented by 3-hydroxy-3-methyl-hexanoic acid and fatty acid having 12 or less carbon atoms other than β-hydroxycarboxylic acid from sweat collected from an axillary region, and analyzing each substance at the same time.

Also, Rosenberg et al do not disclose nor imply that the comprehensive strength and quality of body odor of a human, particularly, axillary odor, and the level of contribution to the body odor by each odor substance are assessed by analyzing each of plural odor substances different in odor types at the same time.

In Labows et al, as aforementioned, plural components including short-chain fatty acids such as 3-methylhexenoic acid are mentioned as the causative agents of axillary odor, however, there is no mention about difference in odor types between these fatty acids and β-hydroxycarboxylic acid such as 3-hydroxy-3-methyl-hexanoic acid.

That is, Labows et al do not disclose nor imply that β-hydroxycarboxylic acid and fatty acid having 12 or less carbon atoms other than β-hydroxycarboxylic acid contribute to different types (quality) of body odor of a human such that β-hydroxycarboxylic acid represented by 3-hydroxy-3-methyl-hexanoic acid contributes to cumin-like apocrine odor while fatty acid having 12 or less carbon atoms other than β-hydroxycarboxylic acid contributes to acid odor. In addition, Labows et al. does not disclose nor imply that the comprehensive strength and quality of body odor of a human, particularly, axillary odor, and the level of contribution to the body odor by each odor substance are assessed by separating

β-hydroxycarboxylic acid represented by 3-hydroxy-3-methyl-hexanoic acid and fatty acid having 12 or less carbon atoms other than β-hydroxycarboxylic acid from sweat collected from an axillary region, and analyzing each substance at the same time.

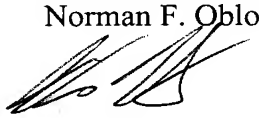
Therefore, Applicants submit that the skilled artisan would not conceive of the assessment method of amended Claims 31-36 of the present invention and the claims dependent therefrom even when considering the combined disclosures of Rosenberg et al, Labows et al, Natsch et al, and Hoer et al.

Withdrawal of this ground of rejection is requested.

Applicants submit that the present application is now in condition for allowance. Early notification of such action is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon



Vincent K. Shier, Ph.D.
Registration No. 50,552

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413-2220
(OSMMN 08/03)